REU – Week 8

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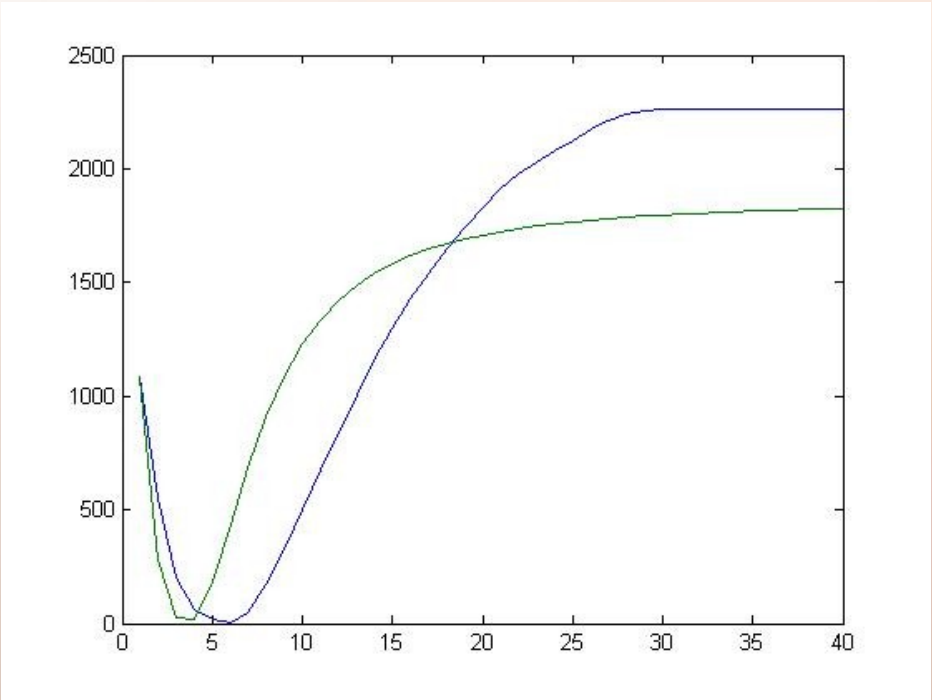
Summary

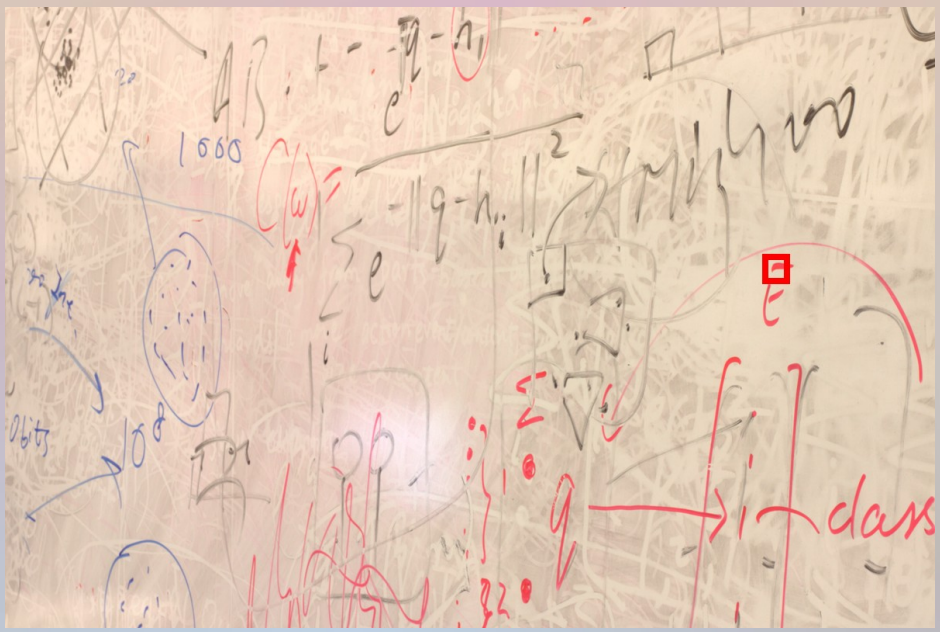
- Got our C++ code to save data cost to binary file
- Got MATLAB to read it
  - Need to get MATLAB to write modified data costs to binary and get C++ code to read it
- Analyzing data cost under different conditions
  - Different types of blur
  - Different size images
- Experimenting with data cost

Analyzing Data Cost

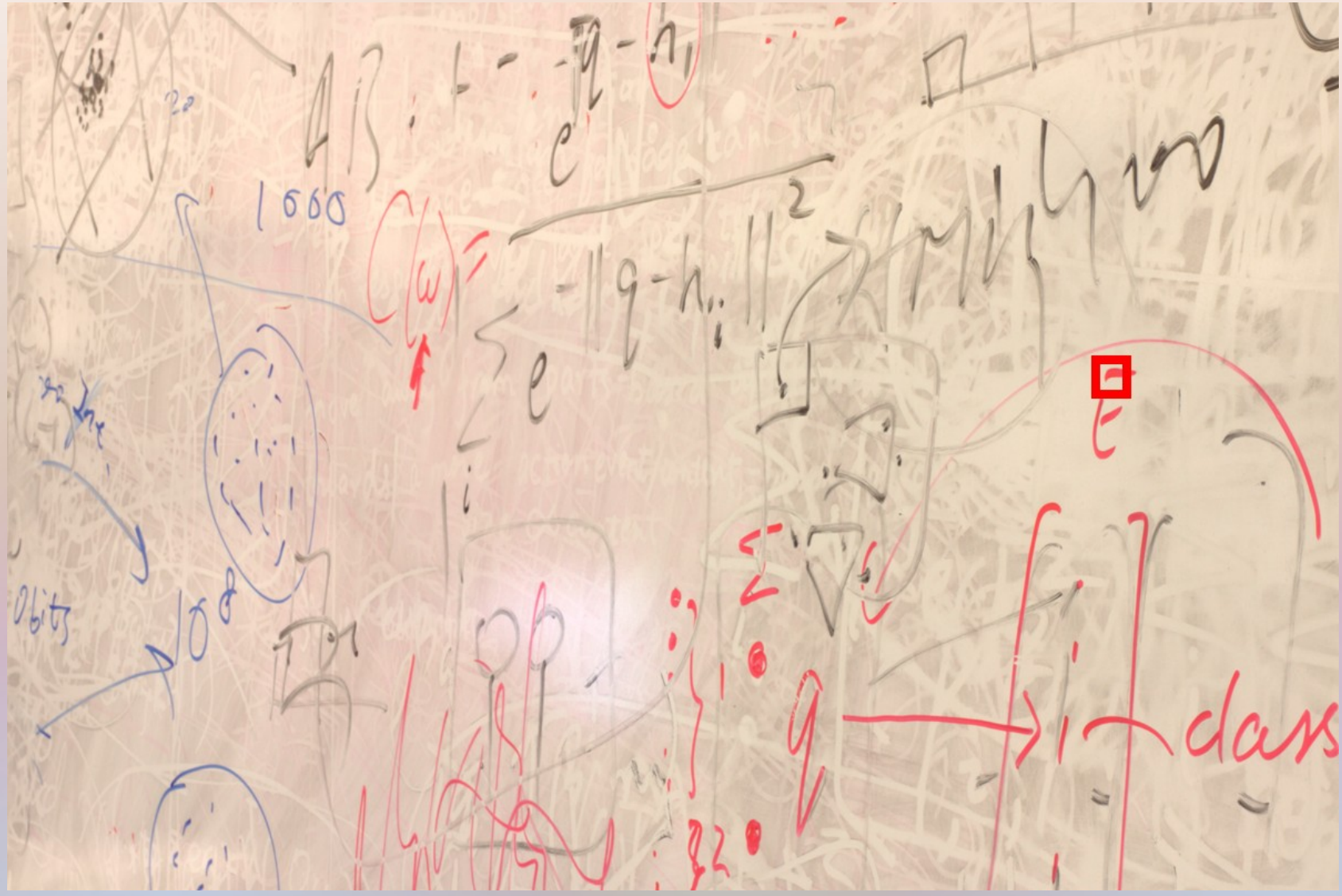
- Pick 30+ points on an image
  - Mostly edges and corners
- Plot the data cost for each possible label at each point
- May indicate the possibility of a simpler method
- Also an indicator of noise levels

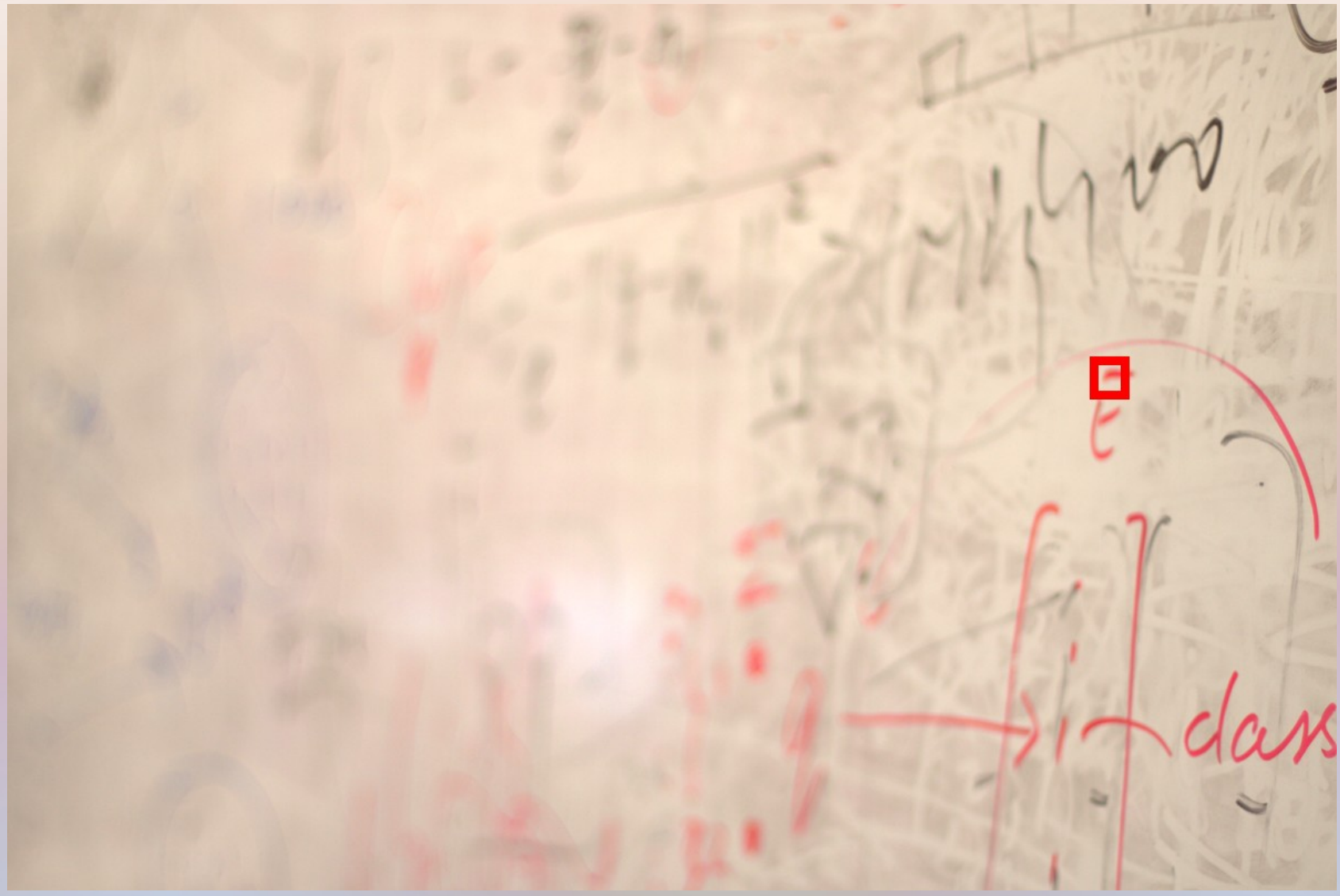


- Green – gaussian blurs
- Blue – pillbox blurs

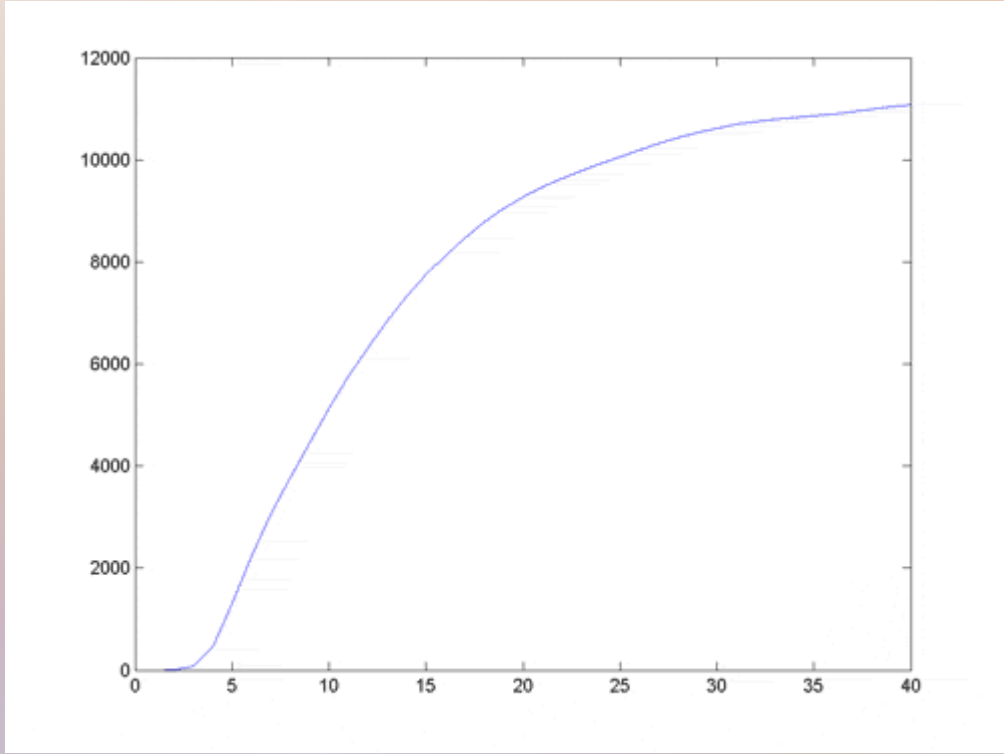


- (x,y) = (994,338)
- 1200 x 800 pixels


1000
C(w) =
Obits
100

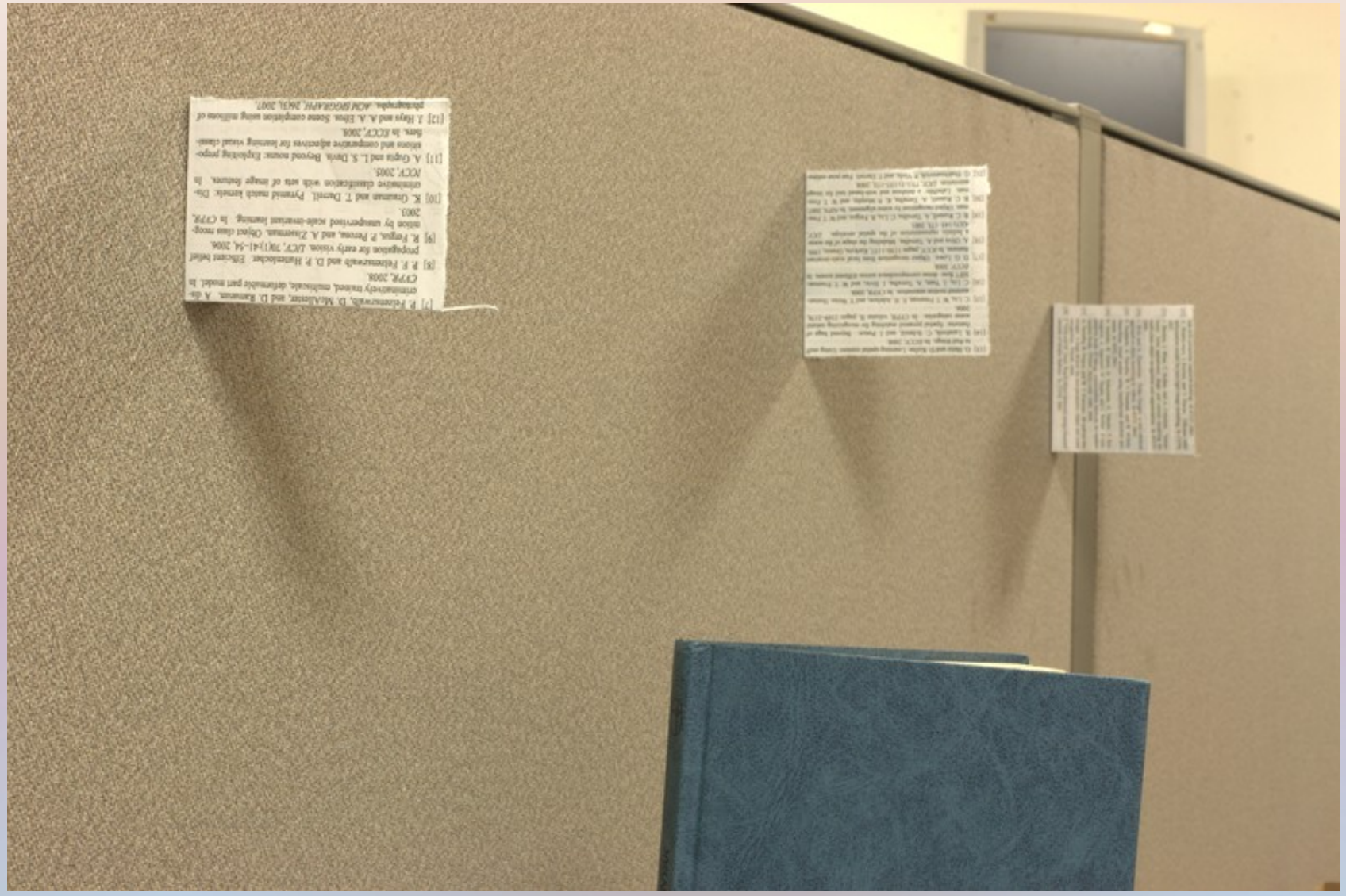

dans

Analyzing Data Cost

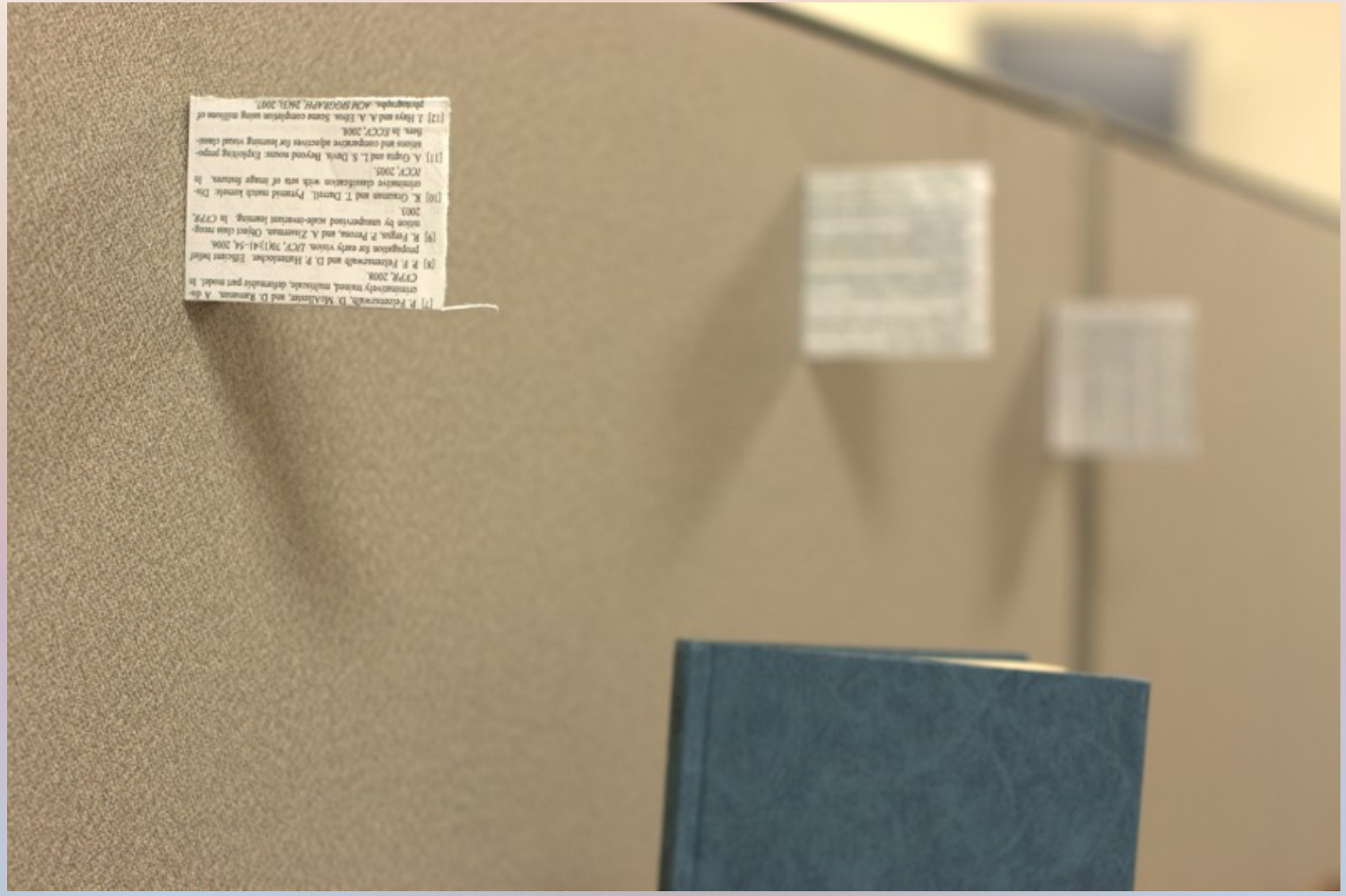


- Should ideally have a single minimum
- Multiple and broad local minima are a source of noise
- If our method can be adjusted to give more ideal data costs, may be able to simplify optimization

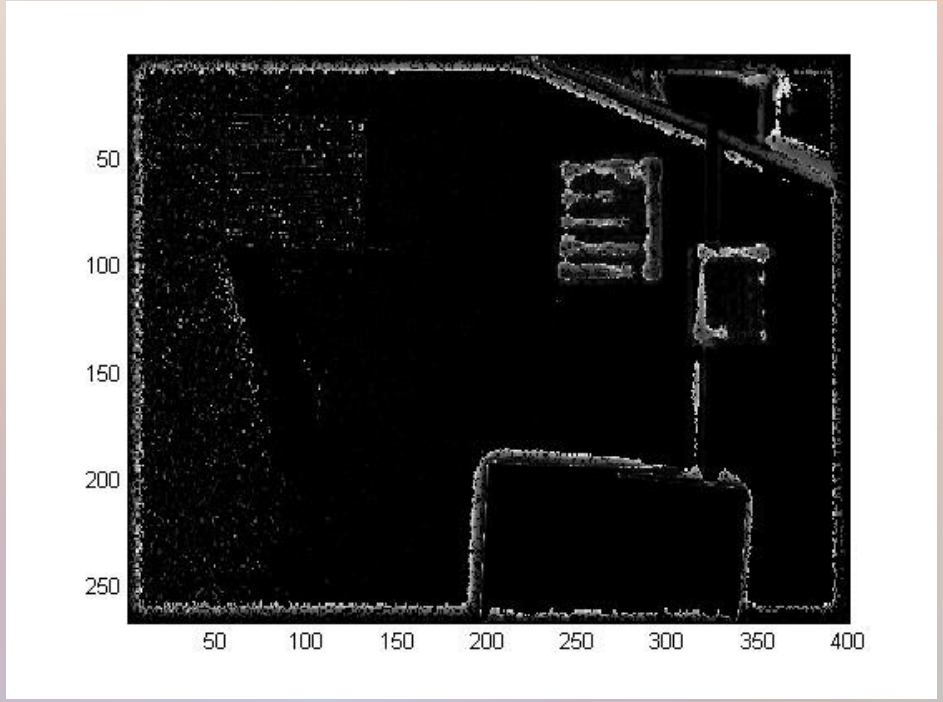
Experimentation



Experimentation

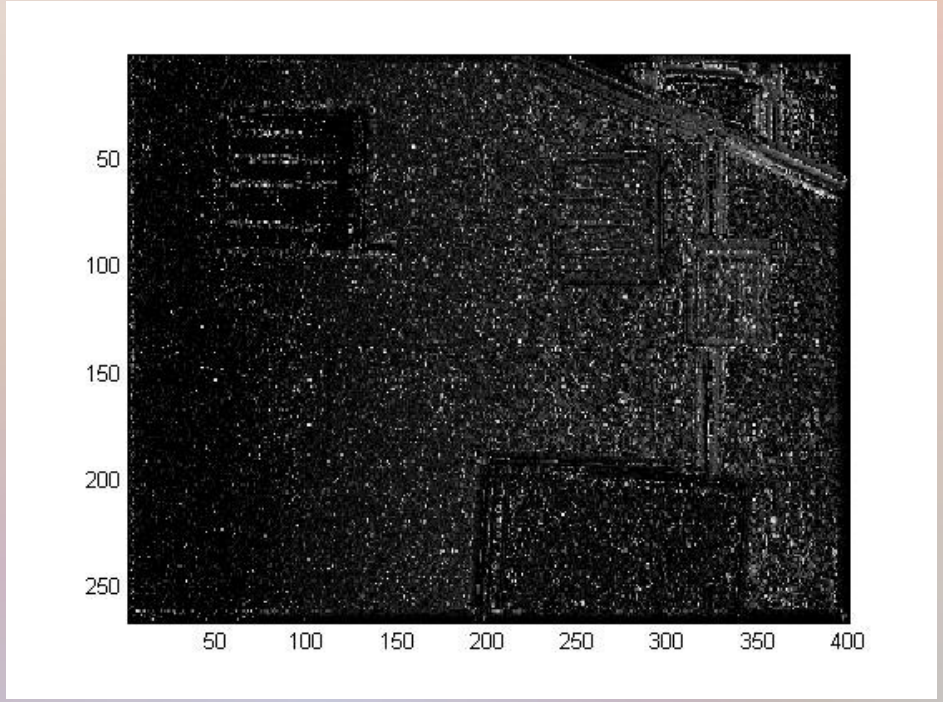


Experimentation



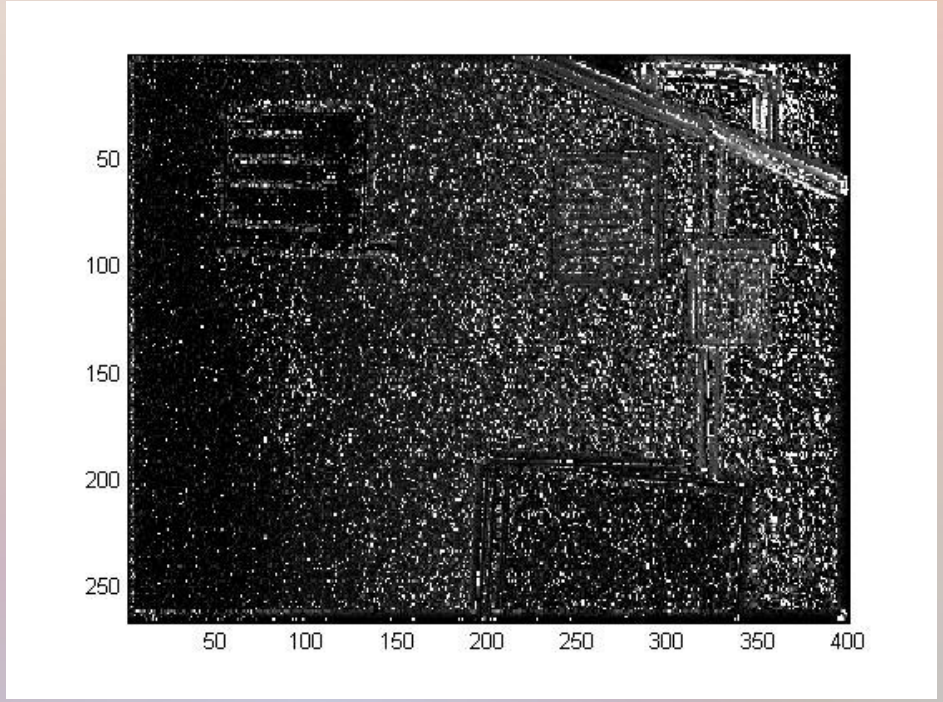
- Convolve sharp image with increasing blurs
- Compare pixel values at every pixel
- Not very good
  - Needs a lot of texture
  - Not very accurate

Experimentation



- Convolve sharp image with increasing blurs
- Compare first derivative at every pixel
- Better than before
  - Needs less texture
  - But it's noisy
  - Might look okay with segmentation

Experimentation



- Without noise reduction
- Since the data cost may have several minima, choose the first depth for which the data cost is within a certain range from the absolute minimum.
- Doesn't seem to affect accuracy *too* much

Plans

- Keep experimenting with data cost
- Try to get our C++ code to use the derivate to compare to our current results
  - Almost had it, but the graph cut didn't seem to work on it for some reason...